

Bellwork: 11/9/12

Find the equation of a line that goes through the point $(-4, 9)$ and is perpendicular to $2x - 5y = 15$.

$$m_1 = -\frac{5}{2} \quad \frac{-2x}{-5} = \frac{-2x}{-5} + \frac{15}{-5}$$

$$y - 9 = -\frac{5}{2}(x + 4) \quad y = \frac{2}{5}x - 3$$

$$y - 9 = -\frac{5}{2}x - 10$$

$+9 \qquad +9$

$$y = -\frac{5}{2}x - 1$$

Unit 2: Chapter 4 - Quadratic Functions:

Section 4.1 - Graphing Quadratics in VERTEX Form

VERTEX Form: $y = a(x - h)^2 + k$

Vertex: (h, k)

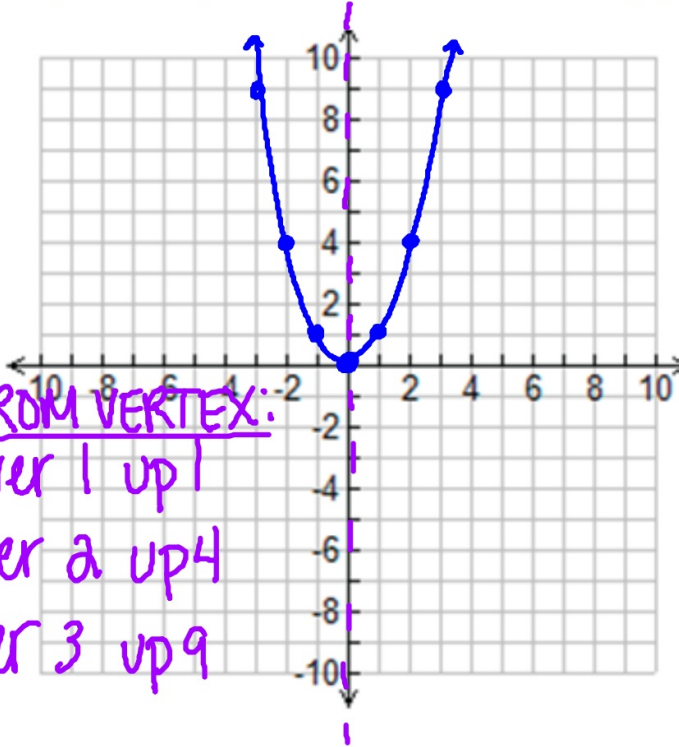
****REMEMBER:** "h" is always opposite what appears

$$(x - 3)^2 \rightarrow h = 3$$

$$(x + 3)^2 \rightarrow h = -3$$

$$y = x^2$$

Graph of a quadratic with vertex at (0,0) and "a" = 1:



FROM VERTEX:

over 1 up 1

over 2 up 4

over 3 up 9

vertex: (0,0)

$$a = 1$$

axis of symmetry:
line where graph is
cut in half

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Graph each of the following quadratic functions:

① $y = -x^2$

$$a = -1$$

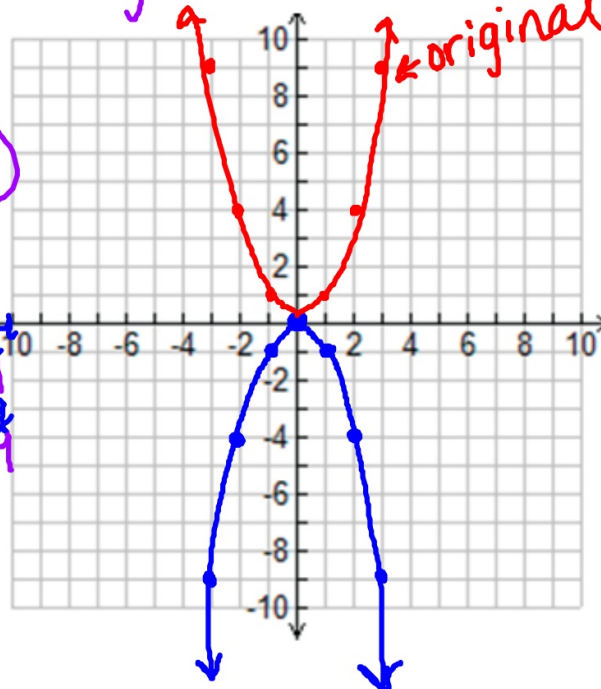
$$(h, k) = (0, 0)$$

over 1 ~~down 1~~
~~up 1~~

over 2 ~~down 4~~
~~up 4~~

over 3 ~~down 9~~
~~up 9~~

$$y = -1(x-0)^2 + 0$$



② $y = (x-3)^2 + 2$

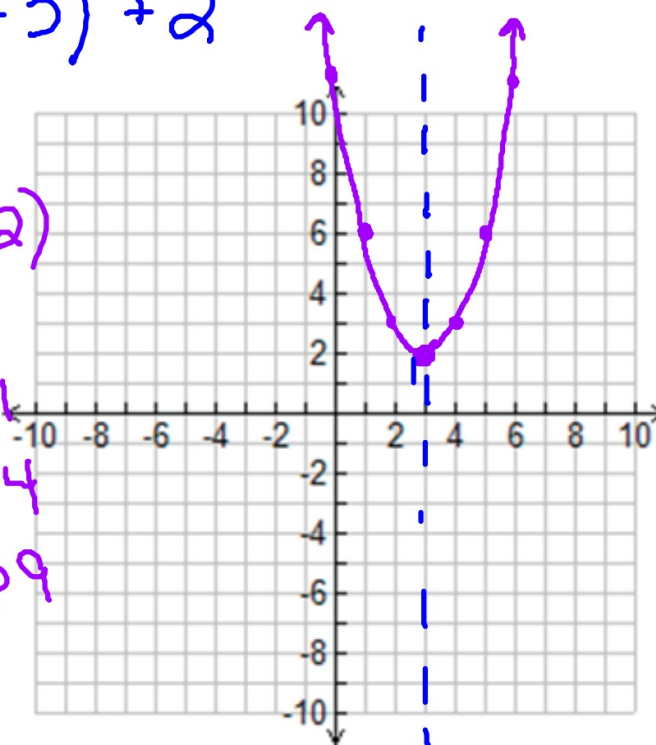
$a = 1$

$(h, k) : (3, 2)$

over 1 up 1

over 2 up 4

over 3 up 9



③ $y = (x+4)^2 - 2$

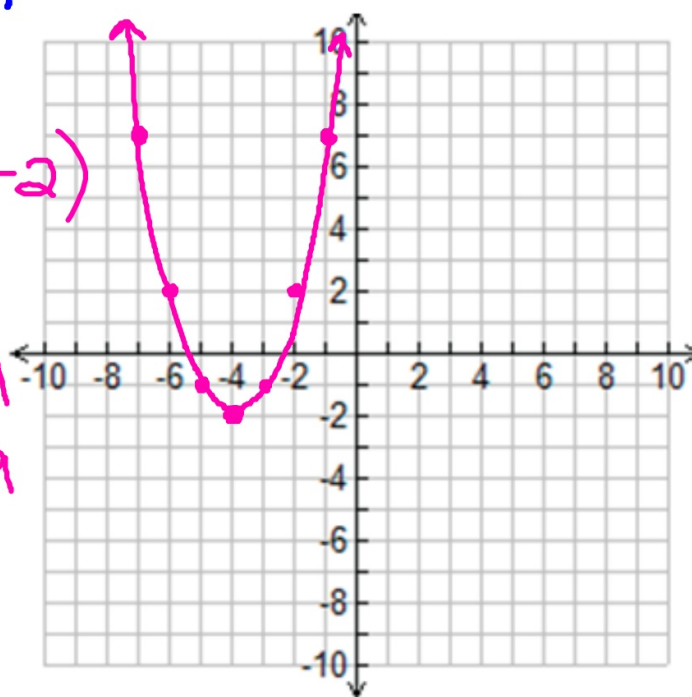
$a = 1$

$(h, k) : (-4, -2)$

over 1 up 1

over 2 up 4

over 3 up 9



④ $y = -(x-1)^2 - 3$

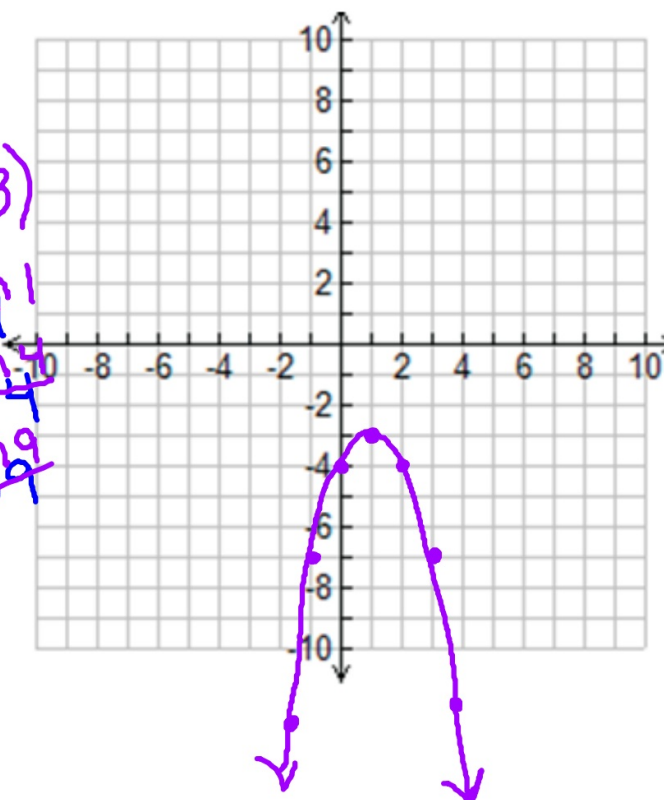
$a = -1$

$h, k = (1, -3)$

over 1 ~~down 1~~
~~up 1~~

over 2 ~~down 4~~
~~up 4~~

over 3 ~~down 9~~
~~up 9~~



⑤ $y = 2x^2$

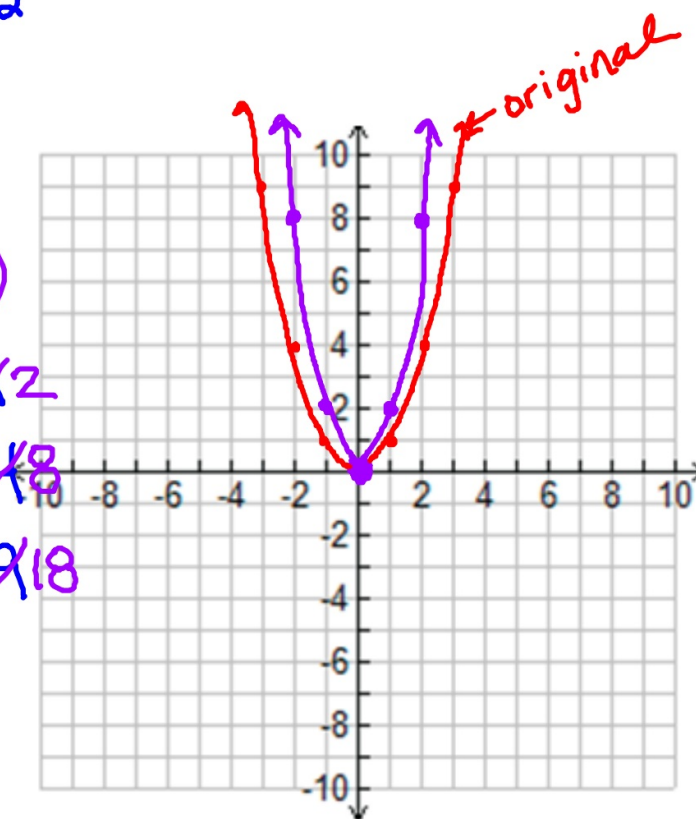
$a = 2$

$h, k = (0, 0)$

over 1 ~~up 1~~ $\times 2$

over 2 ~~up 4~~ $\times 8$

over 3 ~~up 9~~ $\times 18$



⑥ $y = \frac{1}{2}x^2$

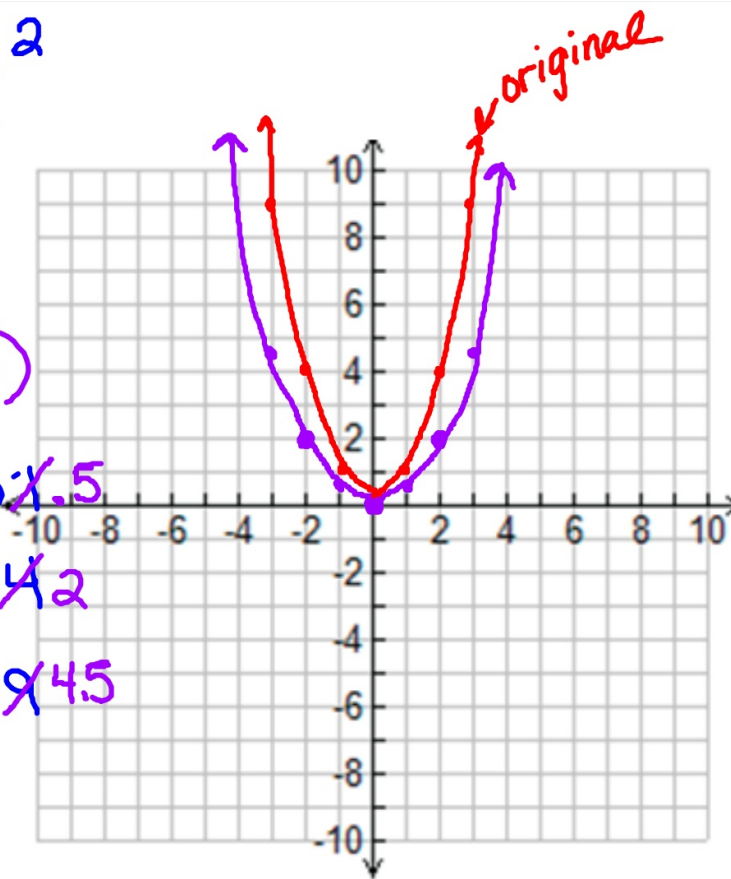
$a = \frac{1}{2}$

$h, k = (0, 0)$

over 1 up ~~1.5~~

over 2 up ~~4~~ 2

over 3 up ~~9~~ 4.5



⑦ $y = 2(x+1)^2 - 4$

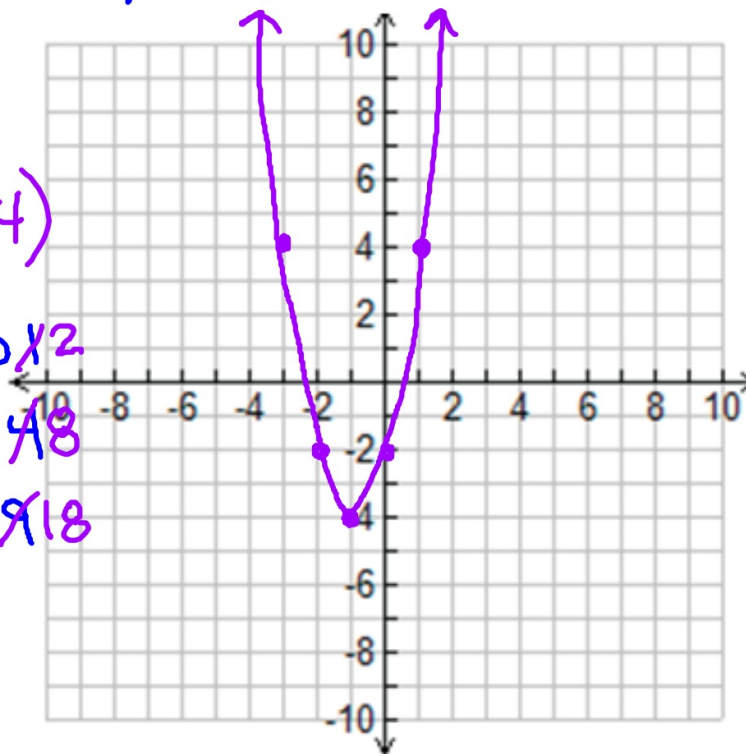
$a = 2$

$(h, k) = (-1, -4)$

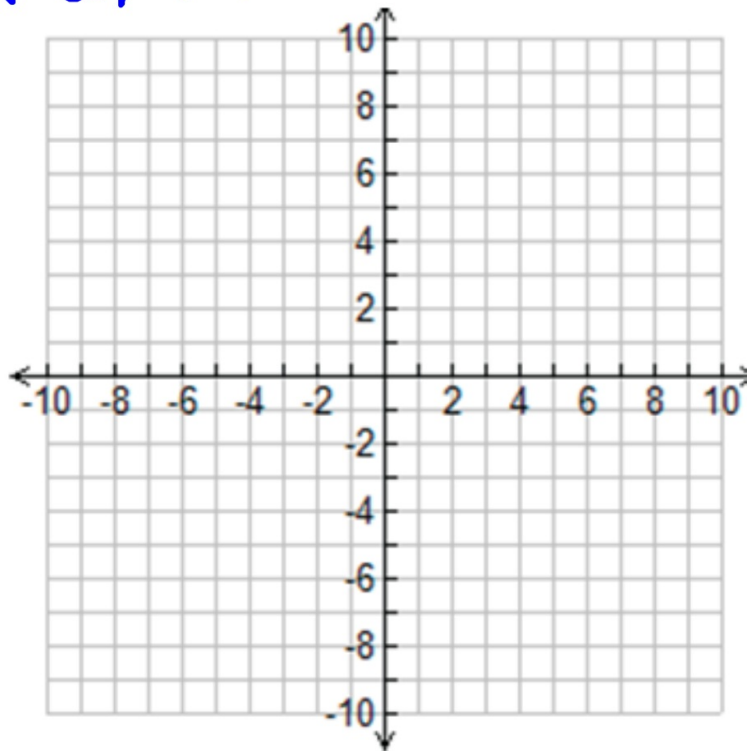
over 1 up ~~1~~ 2

over 2 up ~~4~~ 8

over 3 up ~~9~~ 18



$$\textcircled{8} y = \frac{1}{2}(x-2)^2 + 1$$



$$\textcircled{9} y = -2(x-2)^2 + 6$$

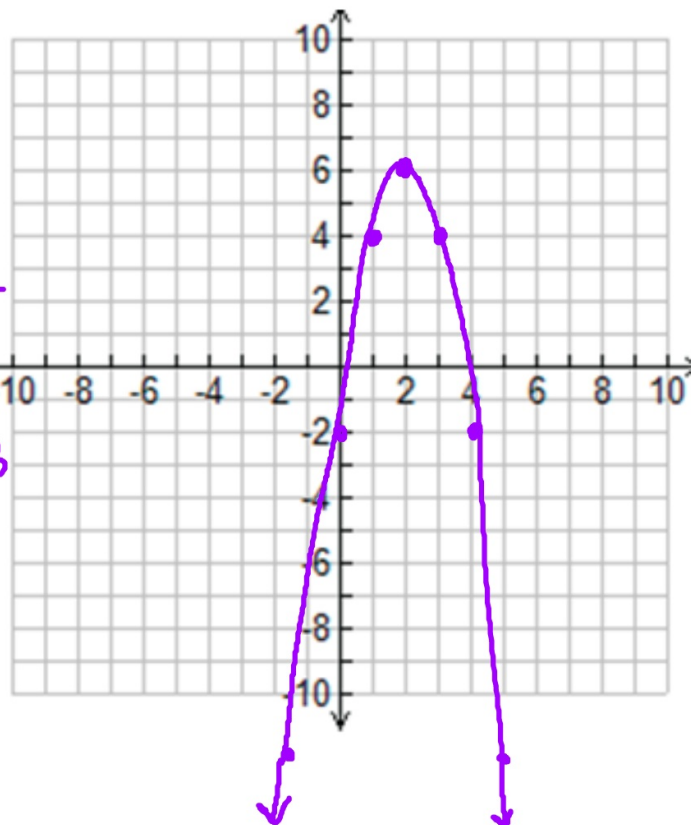
$$a = -2$$

$$(h, k) (2, 6)$$

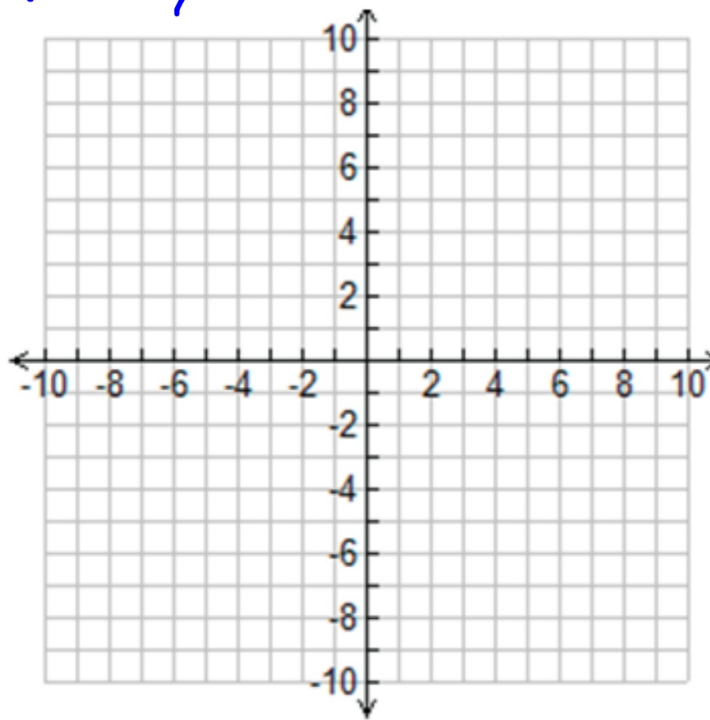
over 1 ~~up 1~~ down 2

over 2 ~~up 4~~ down 8

over 3 ~~up 9~~ down 18



⑩ $y = -\frac{1}{3}(x+4)^2 + 7$



HW:

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